

Võrgurakendused 2

# Info

- Kursuse koduleht
  - [www.lambda.ee](http://www.lambda.ee)
  - Võrgurakendused II
- Tanel Tammet
  - [tammet@staff.ttu.ee](mailto:tammet@staff.ttu.ee)

# Korraldus

- Loeng
  - T 14:00 – 15:30 @ X-221A
  - Iga nädal
- Praktikumid
  - K 8:00 – 9:30 @ IT-213A/B
  - Kaks
  - Tammet
- Külalisloengud
- Lõpeb eksamiga

# Google Protocol Buffers

Aivo Anier

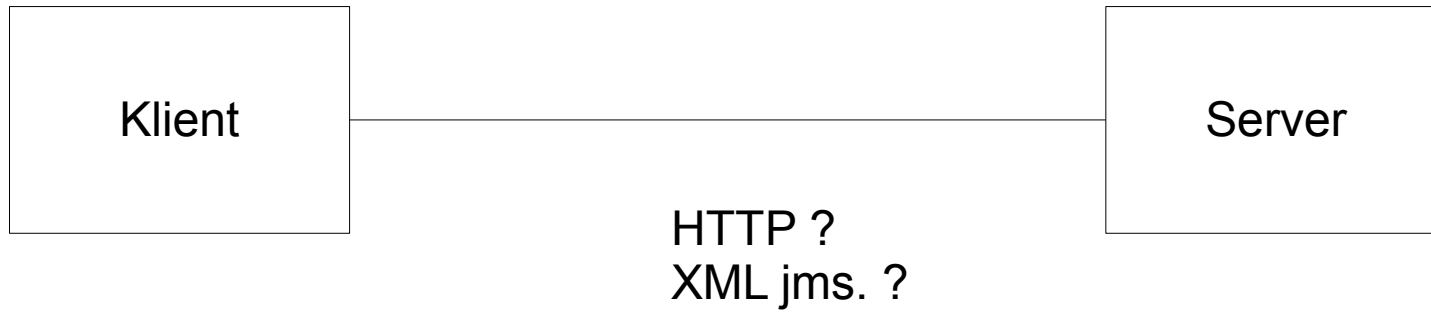
# Milleks?



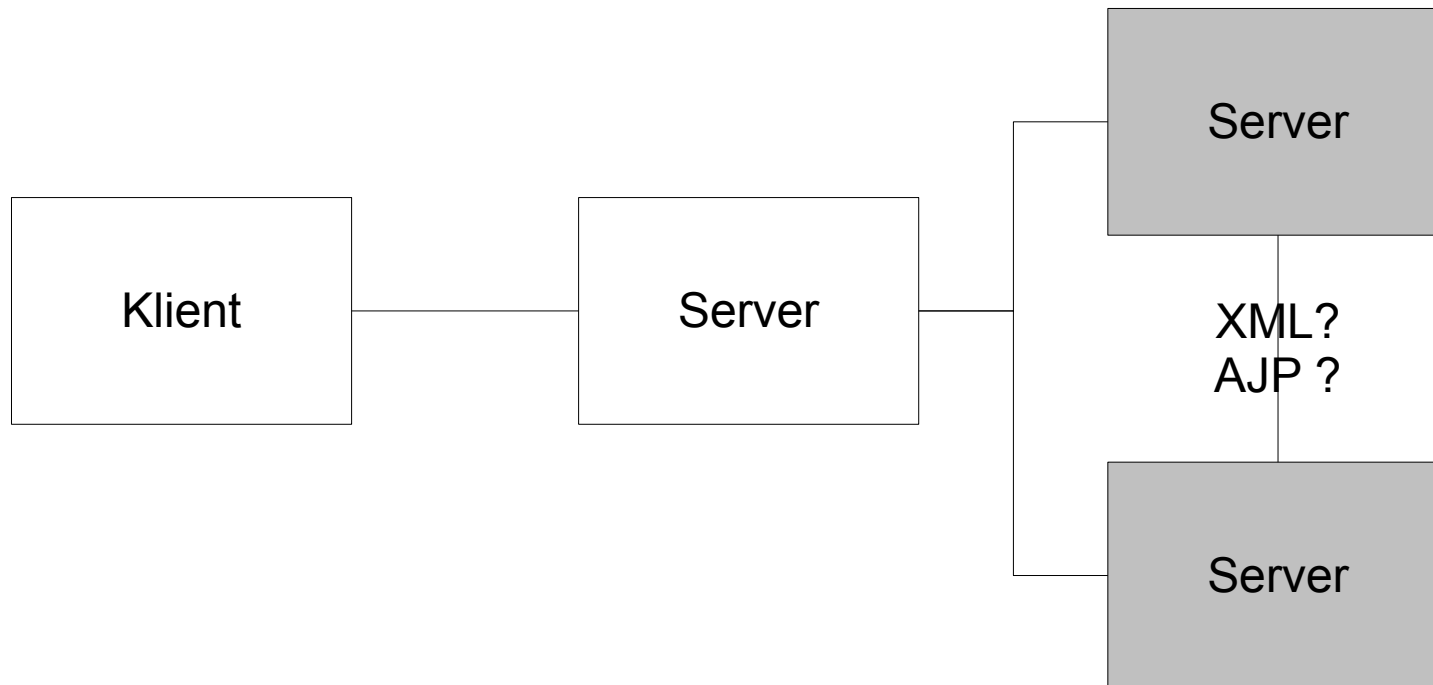
# Milleks?



# Milleks?

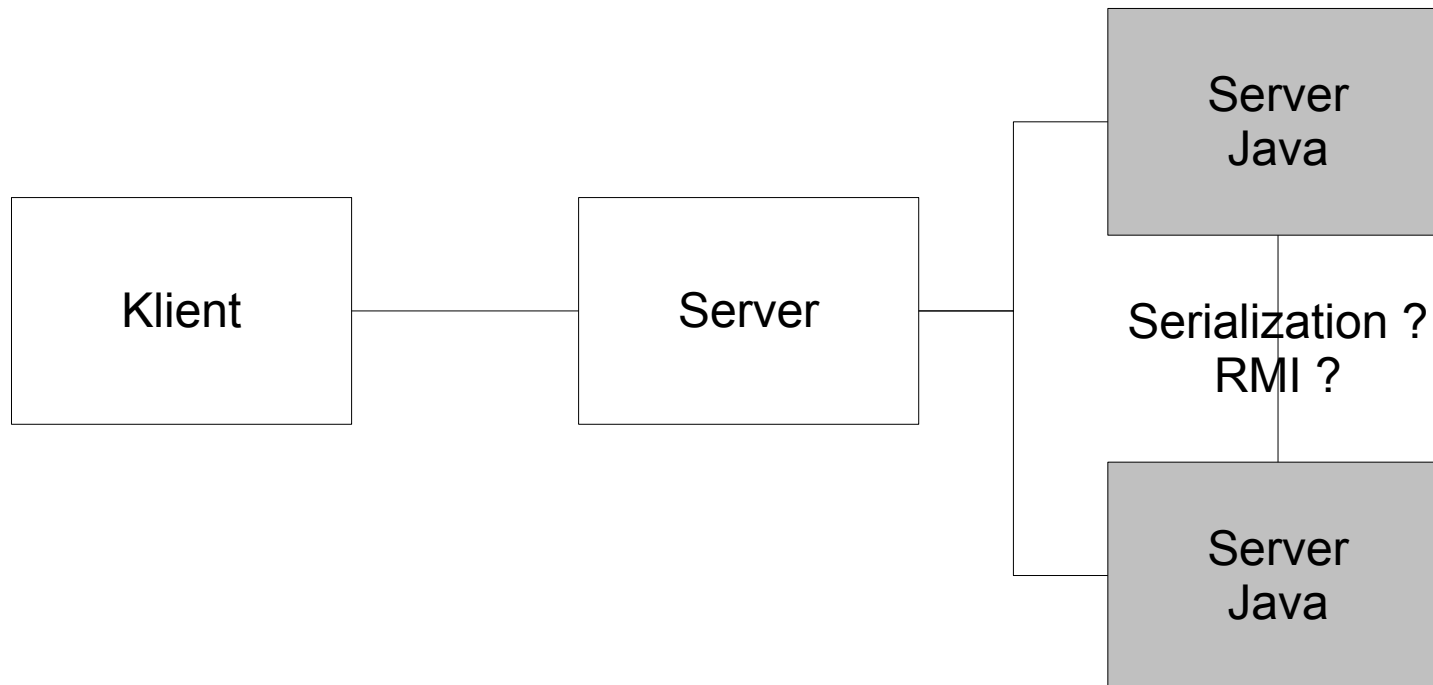


# Milleks?

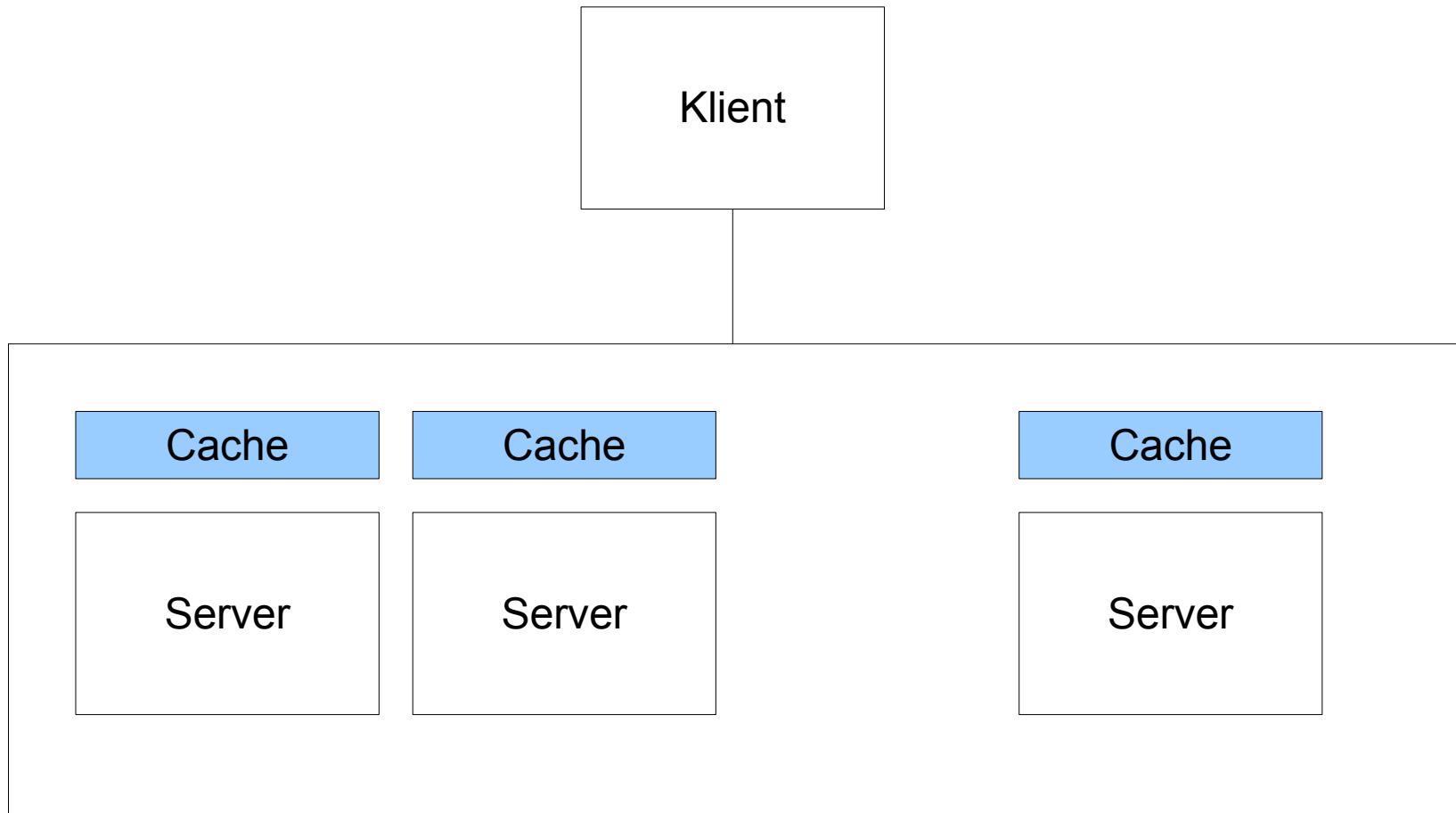




# Milleks?



# Milleks?



# Formaat

- XML
- JSON (BSON)
  - Compressed
  - <http://json.org/example.html>
- YAML
  - <http://en.wikipedia.org/wiki/YAML>
- Serialization
- ...

# Võrdlus

- <https://github.com/eishay/jvm-serializers/wiki/>

# Google Protocol Buffers

- <http://code.google.com/apis/protocolbuffers/>
- "think XML, but smaller, faster, and simpler"
- Java, C++, or Python
- 25 "Third Party Add Ons"
  - <http://.../wiki/ThirdPartyAddOns>
  - MatLab

# IDL + code gen.

- Sõnumivahetus
- Remote Procedure Call – RPC
  - ps. ei sisalda oma RPC pinu
  - Socket
  - Multicast
- Interface Description Language – IDL
  - .proto

# .proto

```
message Person {  
  
    required string name = 1;  
    required int32 id = 2;  
    optional string email = 3;  
  
    enum PhoneType {  
        MOBILE = 0;  
        HOME = 1;  
        WORK = 2;  
    }  
  
    message PhoneNumber {  
        required string number = 1;  
        optional PhoneType type = 2 [default = HOME];  
    }  
  
    repeated PhoneNumber phone = 4;  
}
```

# Andmetüübid

- Andmetüübid
- "streams"
  - ~1MB



# Versioneerimine

- Versioneeritud protokoll
- nö. "tagurpidi ühilduv"
  - i.k. backwards compatible

```
if (version == 3) {  
    ...  
} else if (version > 4) {  
    if (version == 5) {  
        ...  
    }  
    ...  
}
```

# Tools

- Protoc
  - Protocol Buffers Compiler
  - <http://code.google.com/p/protobuf/>
    - downloads
- Protoclipse
  - <http://code.google.com/p/protoclipse/>
  - "ProtoBuf nature"

# Hello world

- Protoclipse
  - *package* directive

# .proto in cpp

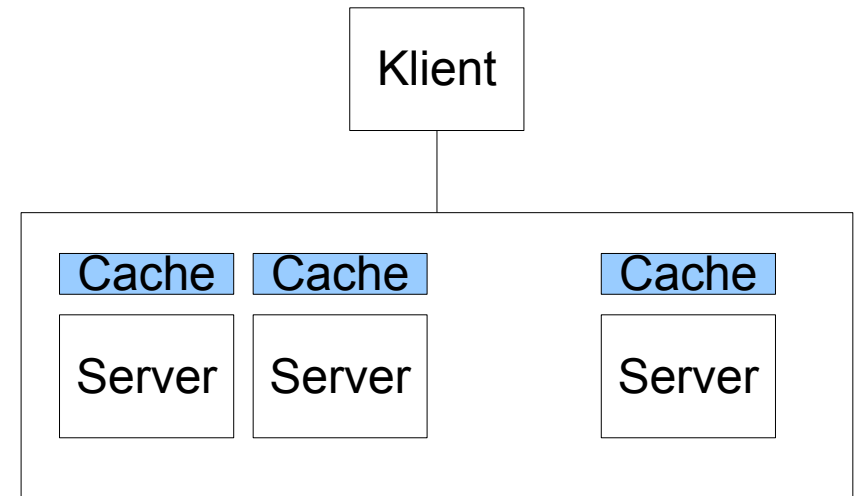
- Protoc
  - *protoc --cpp\_out=mingikataloom **Person.proto***

# MSVC

- Win32 solution
  - IntelliSense
- Include headers
  - .cpp
- Library path
- Libraries
  - libprotobuf.lib
- namespaces!

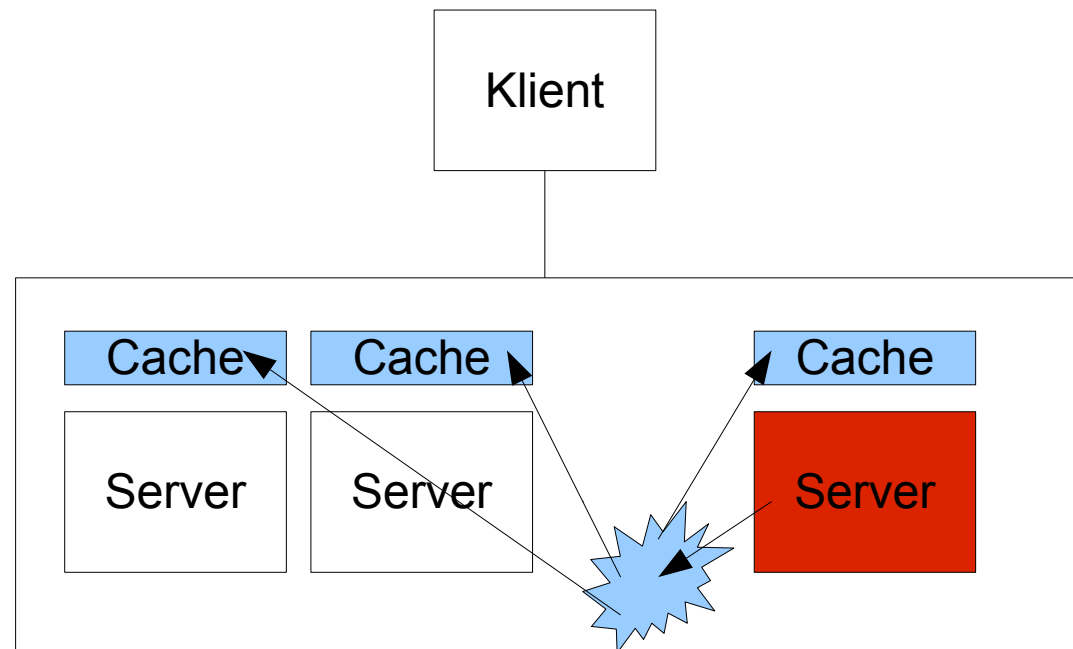
# Thrift

- Facebook
  - [thrift.apache.org](http://thrift.apache.org)
- +
  - (Embedded RPC)
  - Exceptions
- -
  - Versioneerimist pole
  - C++ versioon ei tööta W32 platvormil
  - !Dokumentatsioon



# EhCache + JGroups

- Replicated cache
- Multicast



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